

REMARKS

This is intended as a full and complete response to the Office Action dated January 23, 2009, having a shortened statutory period for response set to expire on April 23, 2009. Claims 1 – 10 have been amended and new claims 13-15 have been added to more clearly recite certain aspects of the invention. No new matter has been introduced by the amendments and the new claims presented herein. The amendments and the new claims have been presented in a good faith effort to advance prosecution on the merits. Applicants reserve the right to subsequently take up prosecution of the claims as originally filed in this application in a continuation, a continuation-in-part and/or a divisional application. Please reconsider the claims pending in the application for reasons discussed below.

Claims 1 – 12 are objected to because of informalities. Applicants have amended claims 1, 2, 3, and 10 as suggested by the Examiner to address the informalities. Additionally, claims 4 - 9 have been amended to address additional informalities. Applicants thank the Examiner for the opportunity to amend the claims for these informalities.

Claims 1 - 3, 6, 7, 9 and 10 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,446,009 (Baeten). Claim 1 is amended to now include, “a decomposition filter having two physical spatial directions.” This amendment is supported throughout the specification, particularly in paragraphs [0020], [0031] and [0041].

The Examiner takes the position that Baeten teaches decomposing a seismic wavefield, wherein a 3D wavefield is obtained by a cross-line acquisition and filtered applying a decomposition filter having two spatial directions to obtain a decomposed wavefield. (Baeten, col. 2, lines 61 – 65; col. 3, lines 10-20; col. 5, lines 3-24; col. 5, lines 48-64; and Fig. 7). However, Baeten does not teach a decomposition filter having **two physical** spatial directions as recited by claim 1. Instead, Baeten discloses spatially filtering data in the frequency wavenumber (F-K) domain. (Baeten, col. 5, lines 10-13). The F-K domain does not represent a physical space as recited by claim 1. Additionally, the spatial filter 42 pointed out by the Examiner in Fig. 7 represents a K

filter (wavenumber filter), which filters in only one direction, not two as recited by claim 1. (Baeten, col. 12, line 1).

Further, Baeten does not teach a 3D wavefield obtained by a cross-line acquisition as recited by claim 1. Rather, Baeten discusses separation of reflection, ground roll energy in the F-K domain maintained for large cross-line **offsets**. Baeten teaches nothing about a 3D wavefield obtained by cross-line **acquisition**, as recited in claim 1. This is significant because as the specification points out, previous methods for applying 3D wavefield decomposition to data acquired in a cross-line geometry introduces an unacceptable level of noise. (See Specification, paragraph [0012]).

Claim 4 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Baeten in view of U.S. Patent No. 4,277,834 (Garibotto). The Examiner concedes that Baeten does not teach that the decomposition filter is a cascade filter. The Examiner attempts to supplement this missing limitation with U.S. Patent No. 4,277,834 (Garibotto). However, like Baeten, Garibotto also does not teach a decomposition filter having **two physical** spatial directions, as recited in claim 1. Accordingly, claim 4 is patentable over Baeten and Garibotto since it depends from claim 1.

Further, Garibotto does not teach or disclose filtering the 3D wavefield by applying a decomposition filter having two physical spatial directions to obtain a decomposed wavefield, wherein the decomposition filter is a cascaded filter. The Examiner takes the position that Garibotto teaches cascaded filters for phase shifting and approximating the wavefield detected by the acoustic sensors. (Garibotto, col. 4, lines 37-64; col. 12, lines 43-65; col. 14, lines 60-67; col. 1, line 65 through col. 2, line 68).

Applicants have reviewed the various sections pointed out by the Examiner and find nothing in those sections that mentions or even alludes to filtering the 3D wavefield by applying a decomposition filter having two physical spatial directions to obtain a decomposed wavefield, wherein the decomposition filter is a cascaded filter. In contrast, Garibotto teaches that “[t]he **result** of filtering ... in cascade ... allows the determination of the position of the source ... and the distance of the source from the array.” (Garibotto, col. 16, lines 10 – 16). The cascaded filters in Garibotto obtain a **source location**, not a decomposed wavefield as recited by claim 4. For this reason,

claim 4 is independently patentable over Baeten and Garibotto. Withdrawal of this rejection is respectfully requested.

Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Baeten in view of “Seismic Data Time-Frequency Domain Filter with Wavelet Transform”, pp. 1223 – 1226, 1997 IEEE International Conference on Intelligent Processing Systems (Tuanyi). Neither Baeten nor Tuanyi, alone or in combination teaches “applying a decomposition filter having two physical spatial directions to obtain a decomposed wavefield, wherein the decomposition filter is a cascaded filter,” as recited by claim 1. Claim 1 is therefore patentable over Baeten and Tuanyi. Because claim 5 depends from claim 1, claim 5 is also patentable over Baeten and Tuanyi. Withdrawal of the rejection is respectfully requested.

Claims 8, 11 and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Baeten in view of U.S. Patent No. 6,654, 693 (Sen). As mentioned above, claim 1 is patentable over Baeten. Like Baeten, Sen also fails to disclose “applying a decomposition filter having two physical spatial directions to obtain a decomposed wavefield, wherein the decomposition filter is a cascaded filter,” as recited by claim 1. Claim 1 is therefore patentable over Baeten and Sen. Because claims 8, 11 and 12 depend from claim 1, claims 8, 11 and 12 are also patentable over Baeten and Sen. Withdrawal of the rejection is respectfully requested.

In conclusion, the references cited by the Examiner, neither alone nor in combination, teach, show, or suggest the claimed invention. Having addressed all issues set out in the office action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

The prior art made of record is noted. However, it is believed that the secondary references are no more pertinent to the Applicants’ disclosure than the primary references cited in the office action. Therefore, it is believed that a detailed discussion of the secondary references is not deemed necessary for a full and complete response to this office action. Accordingly, allowance of the claims is respectfully requested.

Respectfully submitted,

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